

WHAT IS CLAIMED IS:

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1. A method of continuously synthesizing ferrate, comprising:
- mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
  - delivering at least a portion of the mixture to a reaction chamber;
  - continuously generating ferrate in the reaction chamber;
  - delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
  - adding additional iron salt and oxidizing agent to the mixing chamber.
2. The method of Claim 1, further comprising adding a base to the mixture.
3. The method of Claim 1, additionally comprising repeating steps (b) through (d).
4. A method of treating, at a site of use, a mixture having at least one impurity, comprising
- continuously generating ferrate in a reaction chamber located proximal to the site of use;
  - contacting the ferrate with the mixture at the site of use, whereby at least a portion of the impurity is oxidized.
5. A method of treating, at a site of use, a mixture having at least one impurity, comprising
- continuously generating ferrate in a reaction chamber located proximal to the site of use;
  - contacting the ferrate with the mixture at the site of use, whereby at least a portion of the impurity is coagulated.
6. The method of Claim 4, wherein the step of continuously generating ferrate comprises the steps of:
- mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
  - delivering at least a portion of the mixture to a reaction chamber;
  - continuously generating ferrate in the reaction chamber;

- d) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
- e) adding additional iron salt and oxidizing agent to the mixing chamber.

7. The method of Claim 6, further comprising adding a base to the mixture.

8. The method of Claim 5, wherein the step of continuously generating ferrate comprises the steps of:

- a) mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
- b) delivering at least a portion of the mixture to a reaction chamber;
- c) continuously generating ferrate in the reaction chamber;
- d) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
- e) adding additional iron salt and oxidizing agent to the mixing chamber.

9. The method of Claim 8, further comprising adding a base to the mixture.

10. A device for continuously synthesizing ferrate for delivery to a site of use, comprising:

- a) a first holding chamber;
- b) a second holding chamber;
- c) a mixing chamber controllably connected to the first holding chamber and to the second holding chamber, into which a content of the first holding chamber and a content of a second holding chamber are added to form a first mixture;
- d) a reaction chamber controllably connected to the mixing chamber, the reaction chamber adapted to receive the first mixture and maintain the first mixture for a period of time;
- e) a ferrate mixture in the reaction chamber; and
- f) an output opening in the reaction chamber through which the ferrate mixture is adapted to be transported to the site of use,

wherein the site of use is proximal to the reaction chamber.

11. The device of Claim 10, wherein the mixing chamber further comprises a temperature control device.

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12. A method of purifying drinking water comprising contacting ferrate generated by the method of Claim 1 with the drinking water, wherein the contacting is at a site proximal to the generation site.

13. A method of purifying waste water comprising contacting ferrate generated by the method of Claim 1 with the waste water, wherein the contacting is at a site proximal to the generation site.

14. A method of purifying sewage comprising contacting ferrate generated by the method of Claim 1 with the sewage, wherein the contacting is at a site proximal to the generation site.

15. A method of continuously synthesizing ferrate, comprising:

- a) providing a mixture of an iron salt and an oxidizing agent;
- b) continuously delivering at least a portion of the mixture to a heating chamber;
- c) exposing the mixture to elevated temperatures in the heating chamber, thereby generating ferrate;
- d) removing at least a portion of the ferrate generated in step c) from the heating chamber;
- e) adding additional mixture to the heating chamber.

16. A device for continuously synthesizing ferrate, comprising:

- a) a holding chamber;
- b) a mover controllably connected to the holding chamber such that at least a portion of a content of the holding chamber is transferred to the mover;
- c) a heating chamber, through which at least a portion of the mover moves;
- d) an output opening in the heating chamber through which the content on the mover is adapted to be transported to a site of use, wherein the site of use is proximal to the heating chamber.

17. The device of Claim 16, wherein the heating chamber further comprises a temperature control device.

18. A device for continuously synthesizing ferrate, comprising:

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- a) a reaction chamber comprising two electrodes and a solution of an iron salt, wherein the electrodes provide sufficient electric current to convert the solution of an iron salt to a solution of ferrate;
  - b) a holding chamber controllably connected to the reaction chamber, into which the solution of ferrate is kept for a period of time; and
  - c) an output opening in the holding chamber through which the mixture is adapted to be transported to a site of use,
- wherein the site of use is proximal to the holding chamber.

19. A method of continuously synthesizing ferrate, comprising:

- a) continuously providing an aqueous solution comprising an iron salt in a reaction chamber, wherein the mixing chamber comprises at least two electrodes;
- b) providing sufficient electric current to the at least two electrodes to convert at least a portion of the iron salt to ferrate;
- c) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
- d) adding additional aqueous solution to the reaction chamber.

20. The method of Claim 19, further comprising adding a base to the aqueous solution.

21. A method of synthesizing ferrate, comprising:

- a) mixing an aqueous solution comprising an iron salt and an oxidizing agent in a mixing chamber to form a solution of ferrate;
  - b) delivering at least a portion of the solution of ferrate to a site of use that is proximal to the mixing chamber.
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